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CLAIMS

[Claim(s)]

[Claim 1] It is the tape career package for liquid crystal driver ICs which has the connection pad of the couple prepared in the center section corresponding to the external end-connection child and this end-connection child for the I/O signals which are the tape career packages for liquid crystal driver ICs, and were formed in the left end and the right end, and is characterized by connecting through the internal circuitry of the aforementioned liquid crystal driver IC between the connection pads of the aforementioned couple.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the tape carrier package for the driver ICs of a liquid crystal display.

[0002]

[Description of the Prior Art] Drawing 5, drawing 6, and drawing 7 show the relation of connection of the I/O signal between the driver ICs in a liquid crystal display conventionally. Generally the connection between driver ICs is a substrate (Printed Wired Board). It is carried out like drawing 7. Drawing 5 is the TCP configuration of the conventional driver IC. an I/O signal common to two or more driver ICs -- business -- the I/O signal between driver ICs was connected by arranging the external connection terminal area 51 to the TCP (Tape Carrier Package) down side (liquid crystal drive output business opposite side of the external connection terminal area 55), and connecting the lead terminal for connection of PWB 71, 72, and 75 with this terminal area 51 with a pewter For example, vertical size H5 of the conventional PWB It was 15mm or more.

[0003] TCP -- almost -- a center -- the driver chip 57 -- arranging -- a top -- a liquid crystal drive output -- business -- the external connection terminal area 55 and the bottom -- an I/O signal -- business -- the external connection terminal area 51 (common to two or more driver ICs) -- having -- terminal S1 -S7 It is pulling out. A chip portion is covered with a resin and protected electrically and physically. moreover, a liquid crystal drive output -- business -- generally the external end-connection child portion 55 is connected to a direct liquid crystal panel through an anisotropy electric conduction sheet It is possible to supply a signal common to two or more driver ICs by having prepared the slit which sampled TCP equipments in the external end-connection child portion 51 for I/O, and making pewter connection at PWB.

[0004] Drawing 6 is the enlarged view for a connection of a chip 57 and TCP. By sticking thermally by pressure the pad 67 prepared on the chip, and the inner lead 64 prepared in a part for the center section of TCP, it connects electrically and physically. In this case, terminal S1 -S7 of the terminal area 51 for I/O signals It is one at a time to each signal, and, naturally a pad is also one piece at a time.

[0005] Drawing 7 is the gestalt view of the conventional liquid crystal module. When the panel of 640 (longitudinal direction)x400 (lengthwise) dot is imagined, as for eight segment drivers allotted up and down, the number of liquid crystal drive outputs of four common drivers matched for 160 and left-hand side with the number of liquid crystal drive outputs, respectively is 100, respectively.

[0006]

[Problem(s) to be Solved by the Invention] In order to make common connection of two or more driver ICs so that clearly from drawing 5, drawing 6, and drawing 7, the need of allotting PWB is in the upper and lower sides and left-hand side of a panel, and this causes increase of panel size inevitably. Increase-ization of panel size serves as a fatal adverse element in the device of which the miniaturization of a notebook sized personal computer etc. is required. Moreover, since the cost of materials and design development costs of PWB were needed separately, it had troubles, such as causing a price hike of a liquid crystal module.

[0007] The purpose of this invention is to offer TCP for liquid crystal driver ICs which abandoned these troubles.

[0008]

[Means for Solving the Problem] The tape carrier package for the liquid crystal driver ICs of this invention has the connection pad of the couple prepared in the center section corresponding to the external end-connection child and this end-connection child for the I/O signals formed in the left end and the right end, and it is characterized by connecting through the internal circuitry of a liquid crystal driver IC between the connection pads of a couple.

[0009]

[Function] two I/O signals which it has to the both ends of right and left of TCP -- business -- an external end-connection child has a symmetrical I/O signal, the same signal terminal is connected by each electric conduction material, and the terminal of one of them has the slit section which sampled TCP equipments partially between TCP of the neighbors which continue when this TCP is used for a liquid crystal module -- setting -- the I/O signal of the 1st TCP and the 2nd TCP -- business -- between external end-connection children can be connected, without using other path cord, substrates, etc.

[0010]

[Example] One example of this invention is explained below based on drawing.

[0011] Drawing 1 expresses the TCP configuration of the driver IC in the liquid crystal display of this invention. right and left of TCP -- the same I/O signal (S1 -S7) -- business -- the external connection terminal areas 11 and 12 are arranged, the slit 13 which sampled TCP equipments is formed in this section connection terminal area of one side (this example left-hand side 11), and the lead 14 in which pewter connection is possible is formed in the external end-connection child of an opposite side (this example right-hand side 12) It becomes possible to carry out the direct file of between Contiguity IC through PWB by this.

[0012] Drawing 2 is the enlarged view for a connection of the chip 17 and TCP in the driver IC of this invention. This chip 17 is attached in the hole section 20 of drawing 1 . between the pads 27 for the same signals which the pad 27 for the same signals (S1 -S7) is arranged on the right and left inside a chip, and a greatly different point from the conventional technology has in right and left of a chip 17 -- the wiring material 21 inside a chip -- ** -- it connects by the low impedance comparatively A wiring material 21 is formed by conductors, such as two-layer eye metal for example, on ** chip, and a golden bump on ** chip (it forms in the pad section of a TCP article). The pad 28 of 23 for output signals for a liquid crystal drive is formed in the upper part of a chip 17. There is no **** in the lower part of a chip 17 about a pad fundamentally. However, a dummy pad may be arranged in order to secure the connection resilience of a chip and TCP.

[0013] Drawing 4 shows concrete handshaking between ICs in the driver IC of this invention. The near external end-connection child of slit 13b of TCP is allotted upwards, it aligns by allotting the connection lead 14a side of Contiguity IC downward, and both sides are led pewter connection in piles.

[0014] Drawing 3 is an example of liquid crystal module formation, and shows the example of connection of a liquid crystal panel and TCP. drawing 7 of the conventional technical example -- completely -- said -- the dot composition (640x400) which is 1 is imagined, and four common drivers are used for panel left-hand side with eight segment drivers (four upper and lower sides each) which adopted PWB by this invention as the panel upper and lower sides Also in this case, segment drivers are 160 outputs and common drivers are 100 outputs.

[0015] By the connection lead formed in the overlapping TCP portions, pewter connection of between the contiguity devices of eight segment drivers and four common drivers is made mutually. That is, they are three places at a segment side in six places (three upper and lower sides each) and a common side. Moreover, between a common driver and a segment driver can be connected by the same method (in this case, they are two places).

[0016] TCP of the driver IC by this invention can make a configuration small as mentioned above. Vertical size H5 of TCP of the conventional technology shown in drawing 5 as a concrete comparison They are ** and this size H1 of drawing 1 of an example at 15mm or more. It is 6mm or less.

[0017]

[Effect of the Invention] TCP for liquid crystal driver ICs of this invention becomes unnecessary [the substrate for parallel connection]. The liquid crystal module using TCP of this invention can aim at a miniaturization, lightweight-izing, and a cost cut.

[Translation done.]

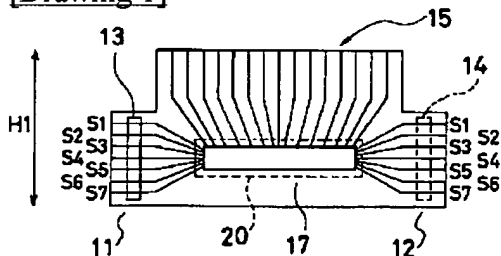
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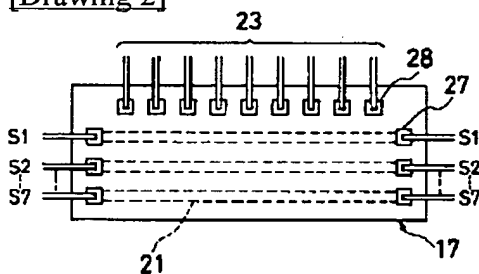
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DRAWINGS

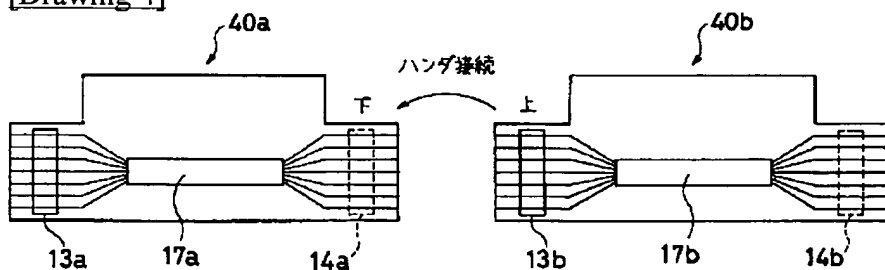
[Drawing 1]



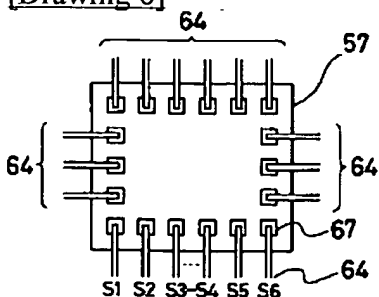
[Drawing 2]



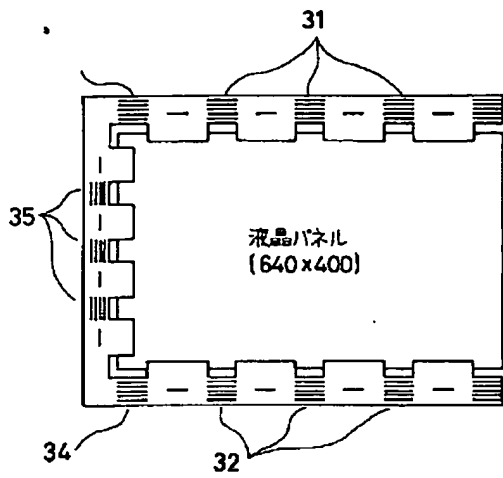
[Drawing 4]



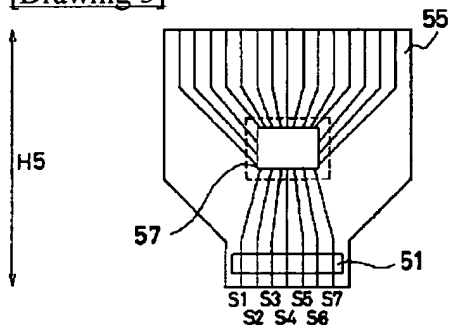
[Drawing 6]



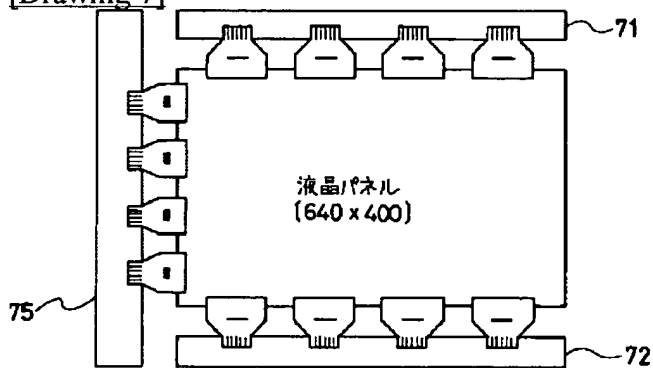
[Drawing 3]



[Drawing 5]



[Drawing 7]



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